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⑭染色又は漂白した経糸の糊付方法

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明細書

1. 発明の名称

染色又は漂白した経糸の糊付方法

2. 特許請求の範囲

(1) 染色又は漂白した開繊状態の経糸を、整経ビームからシート状に解舒し、絞りローラに通して絞り、含水率の低下した経糸を糊付け乾燥してビームに巻取ることを特徴とする染色又は漂白した経糸の糊付方法。

(2) 染色又は漂白した開繊状態の経糸を、整経ビームからシート状に解舒し、温水に通して加熱し、絞りローラに通して絞り、含水率の低下した経糸を糊付け乾燥してビームに巻取ることを特徴とする染色又は漂白した経糸の糊付方法。

3. 発明の詳細な説明

本発明は、染色又は漂白した経糸を糊付けする方法に関する。

従来、ゼンガムやタオルのような先染、先晒織物用の経糸を糊付する場合、数百本の経糸を、整経機にかけて、染色ビームとも呼ばれる中空パレルに多数の小孔を有設した整経ビームに低い張力で軟く薄く巻取つて整経し、その整経ビームを1本又は数本ずつビーム染色機にかけて、精練、漂白、染色又は水洗用の処理液を整経ビームの糸層の内周面から外周面又はその逆方向に循環させ、経糸を整経ビームに巻取つた状態で染色又は漂白する。次に、整経ビームを1本ずつ脱水機にかけて、熱風を整経ビームの糸層の内周面から外周面に吹抜けさせ、染色又は漂白によつて膨潤した経糸を乾燥させ、その整経ビームの所要本数を糊付機にかけて、各整経ビームからシート状に解舒した染糸又は晒糸の経糸を糊付け乾燥して織機ビームに巻取る。

また、染色又は漂白した整経ビームを熱風で乾燥させずに糊付機にかけて、各整経ビームからシート状に解舒した膨潤状態の経糸を、加熱シリンダに通して予備乾燥し、その後、糊付け乾燥して織機ビームに巻取る方法が発明された。

ところが、上記の従来の両方法においては、染色又は漂白によつて膨潤した経糸を無張又は加熱

シリンダで乾燥させるのに多量の熱エネルギーを要する。また、前者の方法において、整経ビームの糸層を熱風で乾燥する際、糸層に乾燥斑が生じ、糸層の内周側と外周側で含水率が異なり、更に、熱風乾燥後の自然乾燥の際、各整経ビームの糸層は経時差や環境差によつて含水率に差が生ずる。また、後者の方法において、整経ビームの糸層が染色又は漂白後に自然乾燥する際、経時差や環境差によつて各整経ビームの糸層の各部の含水率に差が生じ、この含水率の差は加熱シリンダで予備乾燥しても十分に解消しない。結局、両方法においては、経糸の糊付けの際、経糸の含水率が一定ではなくばらついている。従つて、経糸の含水率の差によつて糊の付着量に差が生じ、糊付けを均一に行うことができない。

本発明の目的は、上記のような従来の状況からして、染色又は漂白した経糸を熱エネルギーを節減して均一に糊付けすることのできる染色又は漂白した経糸の糊付方法を提供することである。

本発明者は、上記の目的を遂成するため、染色又は漂白した湿潤状態の経糸を乾燥させる方法について種々実験研究したところ、染色又は漂白によつて湿潤した経糸を整経ビームからシート状に解舒して絞りローラで絞ると、熱エネルギーを要せずに含水率が低下し、しかも、含水率のばらつきが非常に小さくなることを知得したのである。

即ち、第1発明は、染色又は漂白した湿潤状態の経糸を、整経ビームからシート状に解舒し、絞りローラに通して絞り、含水率の低下した経糸を糊付け乾燥してビームに巻取ることを特徴とする染色又は漂白した経糸の糊付方法である。

この糊付方法においては、染色又は漂白した湿潤状態の経糸は絞りローラによつて含水率が低下するので、熱風又は加熱シリンダで乾燥させる従来の方法とは異なり、染色又は漂白によつて湿潤した経糸の乾燥に熱エネルギーを要しない。また、染色又は漂白した湿潤状態の経糸は、絞りローラによつて絞られると、含水率のばらつきが非常に小さくなるので、糊付の際、含水率が均一になり、従つて、糊付が均一に行なわれる。

また、本発明者は、染色又は漂白した湿潤状態の経糸を、絞りローラで絞る前に、温水に通すと、絞りローラで絞られた経糸の含水率のばらつきが更に小さくなることを知得したのである。

即ち、第2発明は、染色又は漂白した湿潤状態の経糸を、整経ビームからシート状に解舒し、温水に通して加熱し、絞りローラに通して絞り、含水率の低下した経糸を糊付け乾燥してビームに巻取ることを特徴とする染色又は漂白した経糸の糊付方法である。

この糊付方法においては、第1発明の糊付方法におけるのと同様に、染色又は漂白した湿潤状態の経糸が熱エネルギーを節減して均一に糊付けられる。その上に、染色又は漂白した湿潤状態の経糸は、温水に通してから絞りローラで絞られると、含水率のばらつきが更に小さくなるので、糊付の際、含水率が更に均一になり、従つて、糊付が更に均一に行なわれる。また、経糸は、糊付の前に温水を通つて加熱されるので、糊液の粘度低下即ち濃度低下が防止される。

次に、本発明の実施例について説明する。

第1発明の実施例（第1図参照）

本例の糊付方法は、先ず、数百本の先染、先晒織物用の経糸を、図示しない整経機に仕掛けて、染色ビームとも呼ばれる整経ビームに低い張力で軟く薄く巻取つて整経し、その整経ビームを1本又は数本ずつ図示しないビーム染色機に仕掛けて、整経ビームに巻かれた経糸を染色又は漂白する。次に、その整経ビームの所要本数を、強制乾燥せずに湿潤状態のまま、第1図に示すように、糊付機のビームスタンド(1)に仕掛け、各整経ビーム(a)から染色又は漂白した湿潤状態の経糸（y_1）をシート状に解舒し、シート状に並列した湿潤状態の経糸（y_1）を糊付機の高圧絞りローラ装置(2)に通して高い圧力で絞り、含水率の低下した経糸（y_2）を糊付機の糊付装置(3)に通して糊付けし、糊付糸（y_3）を糊付機の乾燥シリンダ装置(4)に通して乾燥し、糊付乾燥糸（y_4）を糊付機の巻取部(5)に仕掛けた織機ビーム(b)に巻取る。

具体的な運転条件と経糸の含水率は次の通りで

ある。

織物：ギンガム

経糸：エステル65%と綿35%の混紡糸42番手

経糸本数：4,920本

糊付槽に仕掛ける整経ビームの本数：12本

内訳　整経ビームの内訳：漂白糸8本

青染糸2本

黒染糸1本

茶染糸1本

経糸の各整経ビームへの巻取本数：410本

経糸の各整経ビームへの巻取寸法：幅1370mm

内径150mm

外径300mm

経糸の各整経ビームへの巻上密度：0.38kg/dm

経糸の速度：50m/min

高圧絞りローラ装置の絞り圧力：4500kg/153cm幅

糊付槽の糊液の温度：90℃

整経ビームから解舒された経糸の含水率：130±30%

高圧ローラ絞りされた経糸の含水率：65±15%

糊付けされた経糸の含水率：105%

乾燥仕上された経糸の含水率：5%

上記のデータから明らかなように、高圧絞りローラ装置を通つて高い圧力で絞られた経糸は、含水率のばらつきが非常に小さくなり、含水率が均一の状態で糊付けられるので、糊付が均一に行なわれる。従つて、本例の糊付方法によつて均一で良質の糊付経糸が得られ、次工程の織機において、製織性が良く、最高級のギンガム織物が能率よく生産される。

第2発明の実施例（第2図参照）

本例の糊付方法は、前例のそれにおいて、各整経ビーム(a)からレート状に解舒した扁平状態の経糸(y_1)を、高圧絞りローラ装置(2)に通して高い圧力で絞る前に、第2図に示すように、糊付槽の温水装置(6)に通して加熱するのである。その他の点は前例におけるのと同様であるので、第2図に同一符号を付して説明を省略する。

具体的な運転条件と経糸の含水率は次の通りである。

温水装置の温水の温度：95℃

糊付槽の糊液の温度：90℃

整経ビームから解舒された経糸の含水率：130±30%

温水を通つて高圧ローラ絞りされた経糸の含水率：62±7%

糊付けされた経糸の含水率：105%

乾燥仕上された経糸の含水率：5%

なお、上記以外の運転条件は前例におけるのと同様である。

上記のデータから明らかなように、温水装置を通つてから高圧ローラ絞りされた経糸は、含水率のばらつきが前例におけるのより更に小さくなつて糊付けられるので、糊付が更に均一に行なわれる。

また、温水装置を通つて加熱された経糸は、糊付装置の糊液とほぼ同温に昇温して糊液を通るので、糊液の温度低下即ち粘度低下が防止される。

4．図面の簡単な説明

第1図は第1発明の実施例の糊付方法を示す概略図であり、第2図は第2発明の実施例の糊付方法を示す概略図である。

y_1：染色又は漂白した扁平状態の経糸

a：整経ビーム

2：高圧絞りローラ装置

y_2：高圧ローラ絞りをした経糸

b：織機ビーム

6：温水装置

特許出願人　河本製糊株式会社

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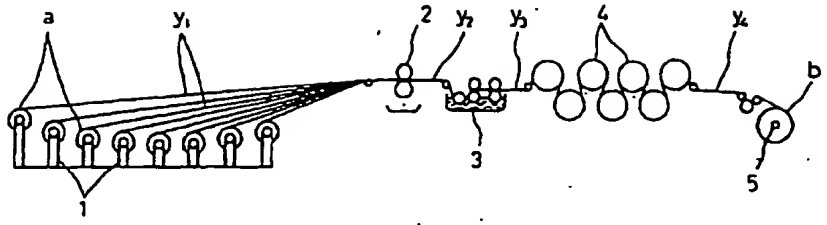
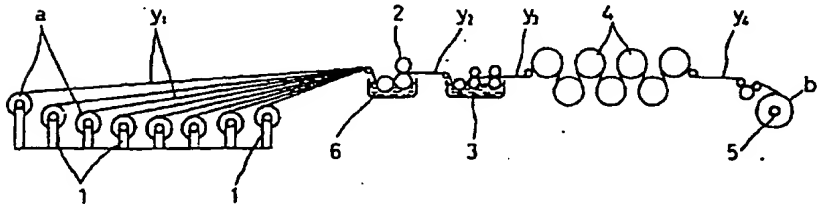
D7

第 1 図



第 2 図



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Specification

1. Title of the Invention

Sizing method of dyed or bleached warps

2. Scope of Patent Claims

(1) A sizing method of dyed or bleached warps in which dyed or bleached warps in a wet state are loosened from warping beams into a sheet shape, the warps are squeezed by making the warps pass through a squeezing roller, the warps with a reduced water content are sized and dried, and the warps are wound around beams.

(2) A sizing method of dyed or bleached warps in which dyed or bleached warps in a wet state are loosened from warping beams into a sheet shape, the warps are heated by making the warps pass through hot water, the warps are squeezed by making the warps pass through a squeezing roller, the warps with a reduced water content are sized and dried, and the warps are wound around beams.

3. Detailed Explanation of the Invention

The present invention relates to a sizing method of dyed or bleached warps.

Conventionally, to prepare warps for pre-dyeing, pre-bleaching woven fabric, several hundreds warps are inserted into a warping machine, and warping is performed by making warping beams each of which forms a large number of penetrating small holes in a hollow barrel called a dyeing beam, wind these warps softly and thinly with a low tension, one warping beam or each set consisting of several warping beams is inserted into a beam dyeing machine

one after another, treatment liquids for scouring, bleaching or washing are circulated from an inner peripheral face to an outer peripheral face of the yarn layers or are circulated in the reverse direction, and the dyeing or the bleaching is performed in a state that the warps are wound around the warping beam. Next, the warping beams are inserted one after another into a hydro extractor in which hot air is blown off from inner peripheral surfaces to outer peripheral surfaces of yarn layers of the warping beams so as to dry the warps which are wet by dyeing or bleaching, a given number of warping beams are inserted into a sizing machine in which the dyed yarns or the bleached yarns loosened in a sheet shape are sized and dried and, thereafter, the yarns are wound around looming beams.

Further, there has been invented a method in which the dyed or bleached warping beams are inserted into the sizing machine without drying the beams with hot air, the warps which are loosened in a sheet shape from respective warping beams are preliminarily dried by making the warps pass through a heating cylinder and, thereafter, the warps are sized and dried and are wound around looming beams.

However, in the above-mentioned conventional method, for drying the warps which are wet through dyeing or bleaching using the hot air or the heating cylinder, a large quantity of thermal energy is necessary. Further, in the former method, at the time of drying the yarn layers of the warping beams with the hot air, a dry mottled pattern is generated on the yarn layers and hence, the water content differs between the inner peripheral side and the outer peripheral side of the yarn layers. Further, at the time of performing the natural drying after the hot-air drying, there

arises difference in the water content among the yarn layers of respective warping beams due to the time sequential difference and the environmental difference. In the latter method, when the yarn layers of the warping beams are naturally dried after dyeing or bleaching, there arises difference in water content between respective portions of yarn layers of the respective warping beams due to the time sequential difference and the environmental difference and this difference in water content is not sufficiently eliminated even when the yarn layers are preliminarily dried using the heating cylinder. As a result, in both methods, at the time of performing the sizing of warps, the water content of the warps is not fixed and is irregular. Accordingly, there arises the difference in an adhered amount of sizing agent due to the difference in water content and hence, the sizing cannot be performed uniformly.

In view of the above-mentioned conventional circumstances, it is an object of the present invention to provide a method for sizing dyed or bleached warps which can perform sizing uniformly while saving the thermal energy for dyeing or bleaching warps.

To achieve the above-mentioned object, inventors of the present invention have carried out various experiments and studies with respect to methods for drying the dyed or bleached warps in the wet state and have found that when the warps which are wet due to dyeing or bleaching are loosened in a sheet shape from the warping beams and are squeezed by a squeezing roller, the water content can be lowered without requiring heat energy and, further, the irregularity of the water content also becomes extremely small.

That is, the first invention is directed to a sizing method

of dyed or bleached warps in which dyed or bleached warps in a wet state are loosened from warping beams into a sheet shape, the warps are squeezed by making the warps pass through a squeezing roller, the warps with a reduced water content are sized and dried, and the warps are wound around beams.

In this sizing method, the dyed or bleached warps which are in a wet state can reduce the water content thereof by the squeezing roller and hence, different from the conventional method which dries the warps using the hot water or the heating cylinder, the thermal energy is not necessary for drying the warps which are wet due to dyeing or bleaching. Further, when the dyed or bleached warps in the wet state are squeezed by the squeezing roller, the irregularity of the water content becomes extremely small and hence, the water content becomes uniform at the time of performing the sizing and hence, the sizing can be performed uniformly.

Further, the inventors of the present invention have found that by making the dyed or bleached warps in a wet state pass through hot water before squeezing the warps using the squeezing roller, the irregularity of the water content of the warps squeezed by the squeezing roller can be further reduced.

That is, the second invention is directed to a sizing method of dyed or bleached warps in which dyed or bleached warps in a wet state are loosened from warping beams into a sheet shape, the warps are heated by making the warps pass through hot water, the warps are squeezed by making the warps pass through a squeezing roller, the warps with a reduced water content are sized and dried, and the warps are wound around beams.

In this sizing method, in the same manner as the sizing method of the first embodiment, the dyed or bleached warps in a wet state can be uniformly sized while saving the thermal energy. In addition to the above, by squeezing the dyed or bleached warps in a wet state by the squeezing roller after making the warps pass through the hot water, the irregularity of the water content can be further reduced and hence, the water content becomes more uniform at the time of performing the sizing whereby the sizing can be performed more uniformly. Further, since the warps are heated by making the warps pass through the hot water before sizing, lowering of a temperature of a sizing agent, that is, lowering of the concentration of the sizing agent can be prevented.

Next, embodiments of the present invention are explained.

Embodiment of the first invention (see Fig. 1)

In the sizing method of this embodiment, first of all, warping is performed such that several hundreds pre-dyeing, pre-bleaching warps are inserted into a warping machine not shown in the drawing in which the warps are softly and thinly wound around warping beams which are also referred to as dyeing beams with small tension. One warping beam or each set consisting of several warping beams is inserted into a beam dyeing machine not shown in the drawings one after another so as to dye or bleach the warps. Next, a given number of warping beams which are in a wet state without performing forcible drying are, as shown in Fig. 1, inserted into beam stands (1) of a sizing machine. The dyed or bleached warps (y_1) in a wet state are loosened in a sheet form and the warps (y_1) in a wet state which are arranged in parallel are squeezed by making the warps (y_1) pass

through a high-pressure squeezing roller device (2) of a sizing machine, and sizing is performed by making the warps (y_2) with the lowered water content pass through a sizing device (3) of the sizing machine, and the sized yarns (y_3) are dried through a drying cylinder device (4) of the sizing machine, and the sized and dried yarns (y_4) are wound around looming beams (b) arranged in a winding portion (5) of the sizing machine.

Specific operational conditions and the water content of the warps are as follows.

fabric: gingham

warp: blended yarn No.45 made of ester 65% and cotton 35%

number of warps: 4920

number of warping beams inserted into sizing machine: 12

content of warping beams inserted into sizing machine:

bleached warps 8

blue dyed warps 2

black dyed warp 1

brown dyed warp 1

winding number of warps around each warping beam: 410

winding size of warps around each warping beam:

width 1370 mm

inner diameter 180 mm

outer diameter 300 mm

winding density of warps around each warping beam:

0.38 kg/cm^3

speed of warps: 50m/min

squeezing pressure of high-pressure squeezing roller device:

4500 kg/153cm width

temperature of sizing agent in sizing device: 90°C

water content of warps loosened from the warping beam: 130±30%

water content of warps squeezed by high pressure roller: 65±15%

water content of sized warps: 105%

water content of dried and finished warps: 5%

As can be clearly understood from the above-mentioned data, the warps which are squeezed at high pressure through the high pressure squeezing roller can extremely reduce the irregularity of the water content and the sizing is performed under the condition that the water content is uniform and hence, the sizing can be performed uniformly. Accordingly, the uniform and good-quality sized warps can be obtained according to the sizing method of this embodiment and, in a loom which constitutes a next step, it is possible to efficiently produce the best-quality gingham fabric with the favorable weaving property.

Embodiment of the second invention (see Fig. 2)

This embodiment is characterized in that, in the above-mentioned embodiment, before squeezing at high pressure the warps (y_1) in a wet state which are loosened from each warping beam (a) into a sheet form by making the warps (y_1) pass through the high-pressure squeezing roller device (2), as shown in Fig. 2, the warps (y_1) are heated by making the warps (y_1) pass through the hot water device (6) of the sizing machine. Since other points are

substantially equal to those of the previous embodiment, same symbols are given in Fig. 2 and their explanation is omitted.

Specific operational conditions and the water content of the warps are as follows.

temperature of hot water in hot water device: 95°C

temperature of sizing agent in sizing device: 90°C

water content of warps loosened from the warping beam:

130±30%

water content of warps squeezed by high pressure roller after passing through hot water:

62±7%

water content of sized warps: 105%

water content of dried and finished warps: 5%

Here, other operational conditions are substantially equal to those of the previous embodiment.

As can be clearly understood from the above-mentioned data, the warps which are squeezed by the high pressure roller after passing through the hot water device are sized with the irregularity of water content further smaller than the irregularity of water content of the previous embodiment and hence, the sizing can be performed more uniformly.

Further, the warps which are heated after passing through the hot water device pass through the sizing agent after the temperature thereof is elevated to a temperature which is substantially equal to the temperature of the sizing agent and hence, lowering of the temperature of the sizing agent, that is, lowering of the concentration of the sizing agent can be prevented.

4. Brief Explanation of the Drawing.

Fig. 1 is a side view showing the sizing method of the first embodiment and Fig. 2 is a side view showing the sizing method of the second embodiment.

y_1: dyed or bleached warps in a wet state

a: warping beam

2: high-pressure squeezing roller device

y_2: warps squeezed by high pressure roller

b: looming beam

6: hot water device

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